SEP 2 2 1998

K982271

Wako

Wako Chemicals USA, Inc.
1600 Bellwood Road, Richmond, VA 23237 U.S.A.

510(k) Summary of Safety and Effectiveness

The Wako Direct LDL-C test is an in vitro diagnostic assay for the quantitative determination of low density lipoprotein cholesterol in serum.

Summary:
Blood total cholesterol levels have long been known to be related to coronary heart disease (CHD). In recent years, in addition to total cholesterol, LDL-C has become an important tool used to assess an individual risk of developing CHD since a strong positive relationship between LDL-C concentration and the incidence of CHD was reported.[1] Thus, there has been substantial interest in LDL-C measurements, and most clinical laboratories routinely perform LDL-C analysis.

The currently accepted reference method is generally referred to as "beta quantification"[2], which involves ultracentrifugation. Because this method is labor intensive and technique dependent, it is generally not used for routine testing. The Friedwald formula[3] is most commonly used for routine purposes. However, since formula estimates LDL-C from measurements of total cholesterol, triglyceride and high density lipoprotein cholesterol (HDL-C), the LDL-C calculation depends on the accuracy and precision of the three measurements. The Wako L-type LDL-C test is a homogeneous assay, which eliminates the preparatory steps or calculation, and thus, can be applied to automated analyzers.

Principle:
When the sample is mixed with R1, the protecting reagent binds to LDL and protects LDL from enzyme reactions. Cholesterol esterase (CHE) and cholesterol oxidase (CO) react with non-LDL lipoproteins (chylomicron (CM), very low density lipoprotein (VLDL) and HDL). Hydrogen peroxide produced by the enzyme reactions with non-LDL cholesterol is decomposed by a catalase in Reagent 1. When Reagent 2 is added, the protecting reagent is removed from LDL and catalase in inactivated by sodium azide (NaN_3). In this second process, CHE and CO react only with LDL-C. Hydrogen peroxide produced by the enzyme reactions with LDL-C yields a color complex upon oxidase condensation with N-(2-hydroxy-3-sufopropyl)-3,5-dimethoxyaniline (HDAOS) and 4-aminoantipyrine (4AA) in the presence of peroxidase (POD). By measuring the absorbance of the blue color complex produced, at approximately 600nm, the LDL concentration in the sample can be calculated.

The safety and effectiveness of the Wako Direct LDL assay is demonstrated by its substantial equivalency to the Equal LDL Direct Liquid Select Cholesterol reagent. Both test systems are used to measure low density lipoprotein cholesterol in serum. In comparison studies against the predicate assay, a correlation coefficient of 0.986 and a regression equation of $y = 1.018x + 0.135$ and a correlation coefficient of 0.988 and a regression equation of $0.98x + 4.18$ were obtained for serum and plasma samples, respectively. In comparison studies against the reference method, a correlation coefficient of 0.983 and a regression equation of $y = 0.97x + 5.12$ was obtained for serum

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samples. Precision studies indicate acceptable values can be obtained on a day to day basis. The minimum detectable level of this method is 1 mg/dL.

References

1. Burtis, C.A. and Ashwood, E.R., Tietz Textbook of Clinical Chemistry. 2nd Ed., Saunders, Philadelphia, 1994.
2. Rifai, N., Warnick, G.R. and Dominiczak, M.H., Ed. Handbook of Lipoprotein Testing. AACC Press, Washington, DC, USA, 1997.
3. Friedwald, W.T., Levy, R.I. and Fredrickson, D.S. Estimation of the concentration of low density lipoprotein cholesterol in plasma without use of the centrifuge. Clin. Chem. **18**, 449-502 (1972).

September 14, 1998
Wako Diagnostics
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DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

SEP 22 1998

Tonya Mallory
Senior Manager
Wako Chemicals USA, Inc.
1600 Bellwood Road
Richmond, Virginia 23237

Re: K982271
Wako Direct LDL-C
Regulatory Class: I
Product Code: MRR
Dated: June 8, 1998
Received: June 29, 1998

Dear Ms. Mallory:

We have reviewed your Section 510(k) notification of intent to market the device referenced above and we have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into either class II (Special Controls) or class III (Premarket Approval), it may be subject to such additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 895. A substantially equivalent determination assumes compliance with the Current Good Manufacturing Practice requirements, as set forth in the Quality System Regulation (QS) for Medical Devices: General regulation (21 CFR Part 820) and that, through periodic QS inspections, the Food and Drug Administration (FDA) will verify such assumptions. Failure to comply with the GMP regulation may result in regulatory action. In addition, FDA may publish further announcements concerning your device in the Federal Register. Please note: this response to your premarket notification submission does not affect any obligation you might have under sections 531 through 542 of the Act for devices under the Electronic Product Radiation Control provisions, or other Federal laws or regulations.

Under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88), this device may require a CLIA complexity categorization. To determine if it does, you should contact the Centers for Disease Control and Prevention (CDC) at (770) 488-7655.

This letter will allow you to begin marketing your device as described in your 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801 and additionally 809.10 for in vitro diagnostic devices), please contact the Office of Compliance at (301) 594-4588. Additionally, for questions on the promotion and advertising of your device, please contact the Office of Compliance at (301) 594-4639. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR 807.97). Other general information on your responsibilities under the Act may be obtained from the Division of Small Manufacturers Assistance at its toll-free number (800) 638-2041 or (301) 443-6597 or at its internet address "http://www.fda.gov/cdrh/dsmamain.html".

Sincerely yours,

Steven Gutman

Steven I. Gutman, M.D., M.B.A.
Director
Division of Clinical
Laboratory Devices
Office of Device Evaluation
Center for Devices and
Radiological Health

Enclosure

510(k) Number (if known): K982271

Device Name: Wako Direct LDL-C

Indications For Use:

A LDL-cholesterol test system is a device intended to measure LDL-cholesterol in plasma and serum. LDL-Cholesterol measurements are used in the diagnosis and treatment of disorders involving excess cholesterol in the blood and lipid and lipoprotein metabolism disorders.

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of Device Evaluation (ODE)

Prescription Use____ OR Over-The-Counter Use____
(Per 21 CFR 801.109)

(Optional Format 1-2-96)